"RED TIN TAG TWINE"

FOR

SELF-BINDING HARVESTERS,

AND HOW IT IS MADE AT THE WORKS OF

L. WATERBURY & CO.

Office, 139 Front St., New York City.

Press of McIlroy & Emmet,
36 Cortlandt Street, N. Y.

ANNUAL PRODUCT, 46,000,000 POUNDS.

DESCRIPTION.

WE will give you an idea of what our Twine is made of, and how it is made.

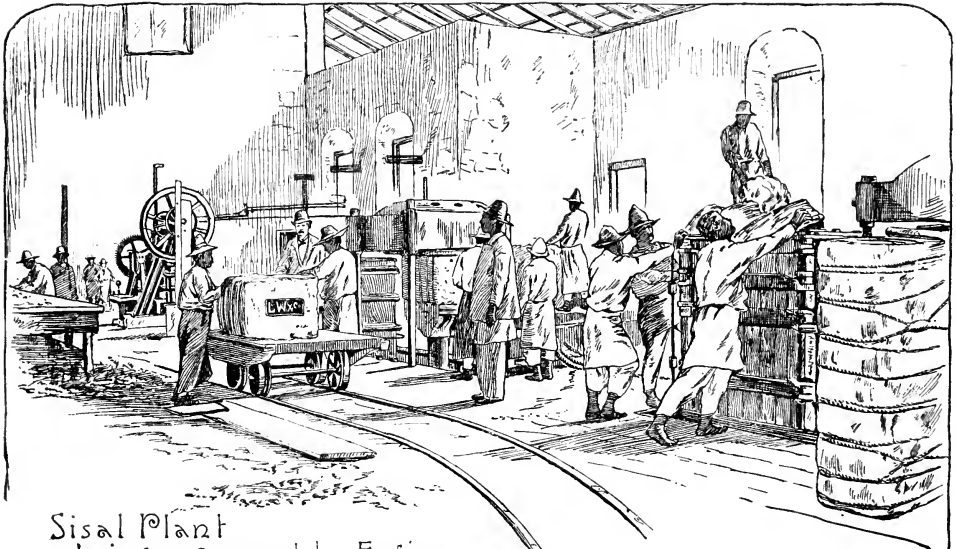
Nearly all the Twine used on self-binding harvesting machines, in this country, is made of Manila and Sisal Hemp mixed, in equal proportions, it having been found that these fibres were far superior to either Russian or American Hemp, or Jute; the Russian or American Hemp rotting very easily when wet, and also being subject to the attack of grasshoppers. Jute Hemp is entirely too weak.

Manila Hemp is grown on Luzon, one of the Philippine Islands, which is a colonial possession of Spain, and is exported from the port of Manila; hence its name. It grows in groves on the uplands, and as you may see by the engraving is very similar to the Banana, but bears no fruit. It is cut down by the natives close to the ground, and the leaves peeled off down to the bottom of the stalk. It is then scraped by a knife, on a wooden block (as is also shown in the engraving), and after having been cleaned in this way it is hung up to dry, and then packed in bales weighing about 275 pounds each. These

Manila Plant with Cooleys preparing it

bales are covered with grass mats, bound tightly by rattans, and shipped to this country, for the most part in sailing vessels, the voyage taking about four months. This Manila fibre is probably the strongest and best fibre in the world. It runs from four to eighteen feet in length, and will stand moisture for a long while without rotting, the fibre being covered with a silicate, which makes it impervious to water.

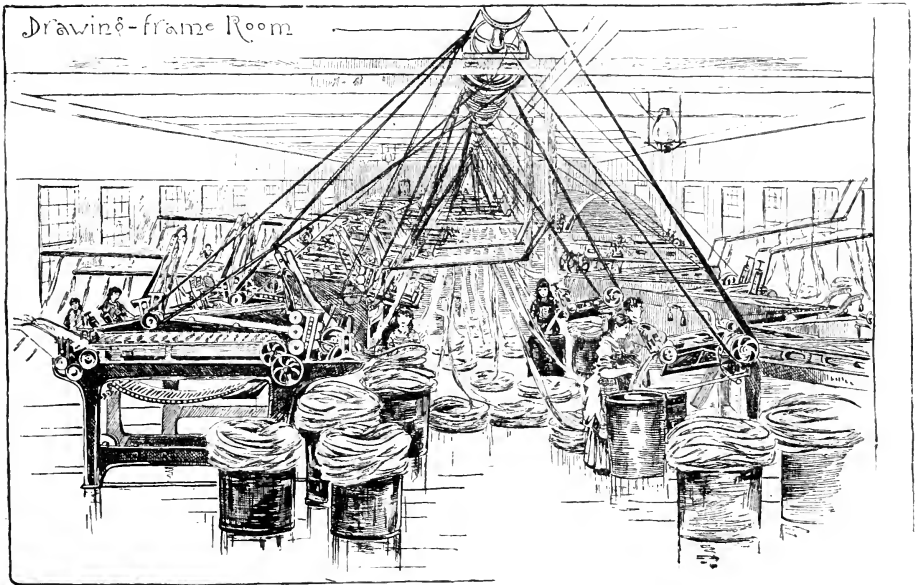
Sisal Hemp is a white fibre, closely resembling Manila, and is found in Yucatan, a province of the Mexican Confederation. The plant from which it is obtained is very much like the Century plant, or Agave, the fibre being obtained from the leaves. These do not run over four feet in length, and the fibres are much stiffer and coarser than Manila, and only about three-quarters as strong. It is, however, very plentiful and more easily obtained, and therefore cheaper. It is used with Manila in making Harvester Twine to bring down the cost, it being found sufficiently strong for that purpose, when mixed in equal proportions. The use of Sisal Hemp is increasing rapidly in this country, and bids fair, in a few years, to surpass that of Manila. It has been a great boon to the country, for without it, Manila Hemp would be now so dear as to a great extent prohibit its use.



Sisal Plant
being prepared by Engine

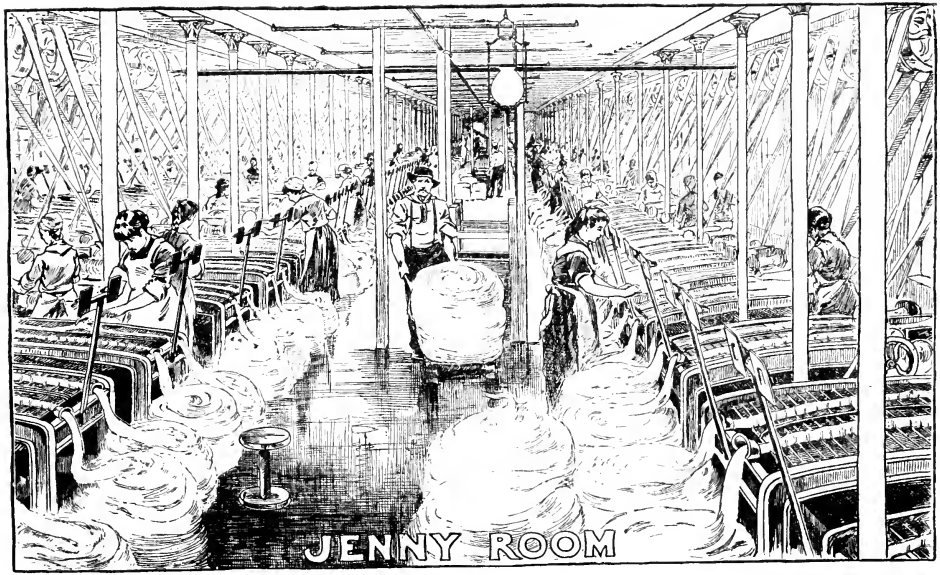
We will now give you a short description of the processes of working these fibres into yarn for Rope and Twine.

After the bales are opened, the fibres are straightened out and sprinkled slightly with oil. They are then carried in elevators to the top stories of the different buildings, and there the fibres are "scutched" by large revolving cylinders covered with sharp steel pins or knives, in order to remove the dirt and tow. They are then passed on to the "breaker," which is a large frame about twenty feet long, consisting of two endless chains, covered with long steel pins. The first chain runs slowly and feeds the fibres to the second, which runs much faster, the effect being to comb or straighten out the fibres, and draw them into a continuous "sliver" or ribbon. This process is then repeated over numerous "drawing-frames,"—similar to the "breaker," but smaller and having finer pins, as the process approaches completion—a number of "slivers" being put together and drawn down to one "sliver" again at the end of each machine. This "drawing" is repeated a number of times, in order to make the "sliver" even, without which it would be impossible to spin fine yarns. After it has been sufficiently "drawn," the "sliver" is run through tubes or "gutters" to the floor below, where it is spun on "jennies" or spinning machines into yarn.


Drawing-frame Room

The principal building in which our Harvester Twine is made is about 200 feet long, by 75 in width and 4 stories high, and is only one of many of the same proportions, in which we make our Rope and other products. The top floor, in which is placed the preparatory machinery exhibited in the engraving, is one continuous room, some 200 by 75 feet, not separated by partitions, but having two rows of iron columns running through the centre, which tend to steady the building and prevent the shaking caused by the great mass of machinery constantly in motion. When you consider that from seventeen to twenty tons of fibre are run through these machines daily, you can imagine at what speed they must go, and how many hands it takes to manipulate it, in order that twenty tons should be drawn down to a "sliver" fit for Harvester Twine.

The jenny-room is situated immediately under the preparation room, and is of the same size. In it are some 214 large spindles, each spindle going at the rate of 1500 revolutions a minute, and on these spindles is spun a part of our enormous production of Harvester Twine. These spindles have to spin daily into fine yarn, running over 600 feet to the pound, the twenty tons of "sliver" that is brought down to them by elevators from the preparation room


JENNY ROOM

above. The engravings of the two rooms just described will give you some idea of the construction of the respective machines.

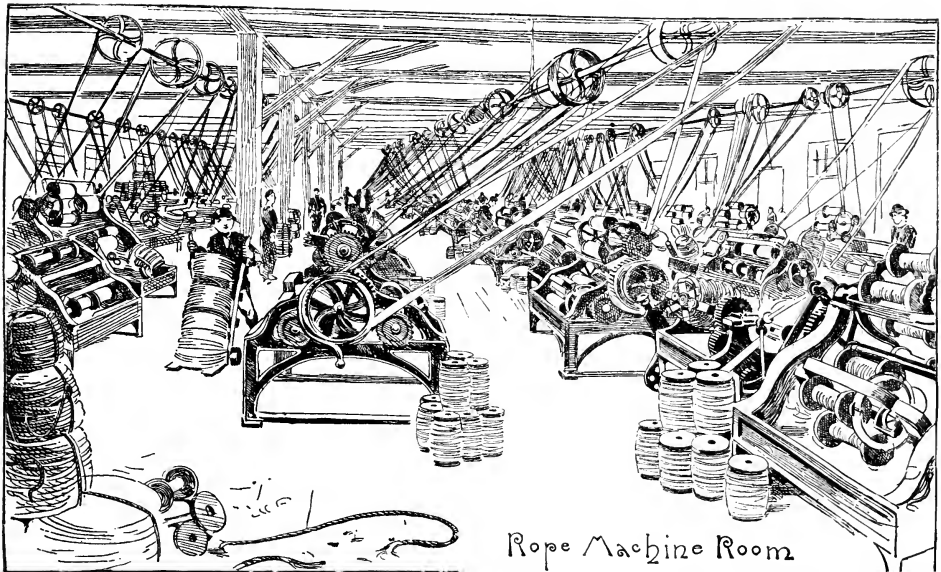
After being spun, the yarn, which is now on bobbins, is carried to the balling machines, which wind it into balls of the proper size to fit the boxes of the harvester machines. Each ball has then attached to its proper end a RED TIN TAG, which shows the user of it the right end to pass through the knotter. These balls are then packed in bags, each bag containing twelve balls and weighing some seventy pounds. By referring to the engraving you will see the manner of packing, and appearance of the bales when ready for shipment. It is important that in this balling process the balls should be compact, otherwise the Twine will not arrive at its destination in good shape, and is more apt to kink. We make hundreds of tests every day to see that the Twine is of sufficient strength and length per pound, and consequently claim that our Twine is the best for the farmer to use.

In rope-making the yarns are prepared in much the same way, but are spun larger, and the bobbins of yarn are then placed in small cars on a railway and carried into the different rope-making departments.

Balling and Packing Room for Twine

The small Rope (below two inches in circumference) is made in one large room about 150 by 100 feet, filled with laying machines, a representation of which can be seen in the engraving. We have some 75 of these small machines, each one turning out ten coils of Rope of different sizes daily. These machines run so perfectly and need so little attention, that one man is able to attend three of them. They are all of American invention, many improvements having been added by us, and are far ahead of any machines of the kind made in any part of the world.

Our large Rope—over two inches in circumference—is made in the "Rope Walk." For this process, it is necessary to re-wind the yarn on to large bobbins, which are put in a frame at the lower end of the "walk," and the yarns are then run through holes in a steel plate, into a tube of the proper size, to form a strand of the rope required. These yarns, after being run through the tubes, are fastened on a hook of the "forming machine," which runs on a railroad, (of which we have eight, each one being considerably over a quarter of a mile in length) the entire extent of the "walk," and is propelled by an endless band driven by steam power. When a number of strands have been fastened on the different hooks of the machine, the machine is started, the hooks revol-



Rope Machine Room

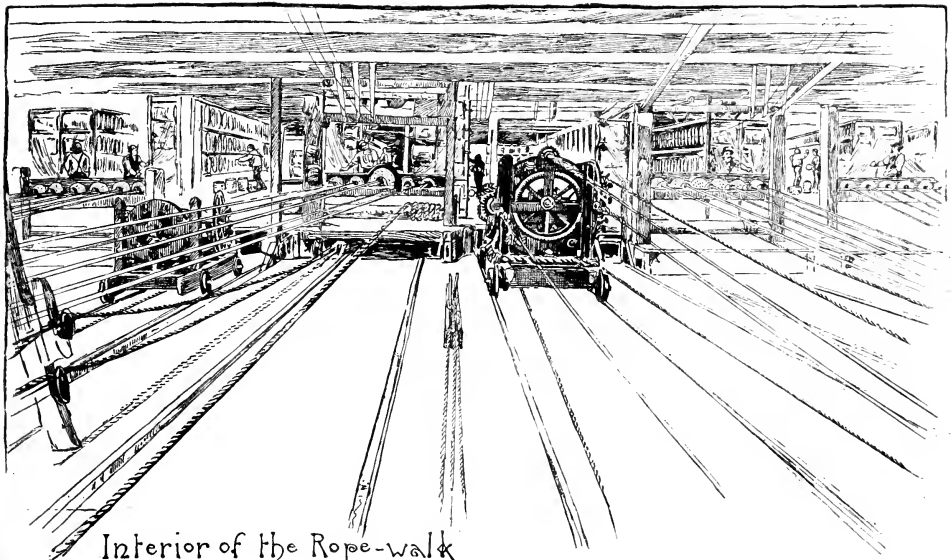
ving at the same time; the strands are thus drawn through the tubes to the upper end of the "walk." To lay these strands into a Rope, two machines are used (one at either end of the "walk,") which twist three or more of these strands together. The Rope is then coiled on a revolving reel, and after being banded is ready for the market.

For making Tarred Rope, the same machines are employed, except in the first place, the yarns are run through a tank of heated tar.

Having profited by all the improvements thus far invented in Rope-making, and having invented many ourselves, we claim that our product is not only equal, but superior to that of any other manufacturer in the world.

At the Centennial Exhibition at Philadelphia, we were awarded the only premium for Manila Rope, although there were many competitors. We had on exhibition at that time a colossal cable, which was $37\frac{1}{2}$ inches in circumference; this cable is probably the largest ever made, and was especially mentioned in the report of the Judges.

In addition to Harvester Twine and Rope, we are large manufacturers of



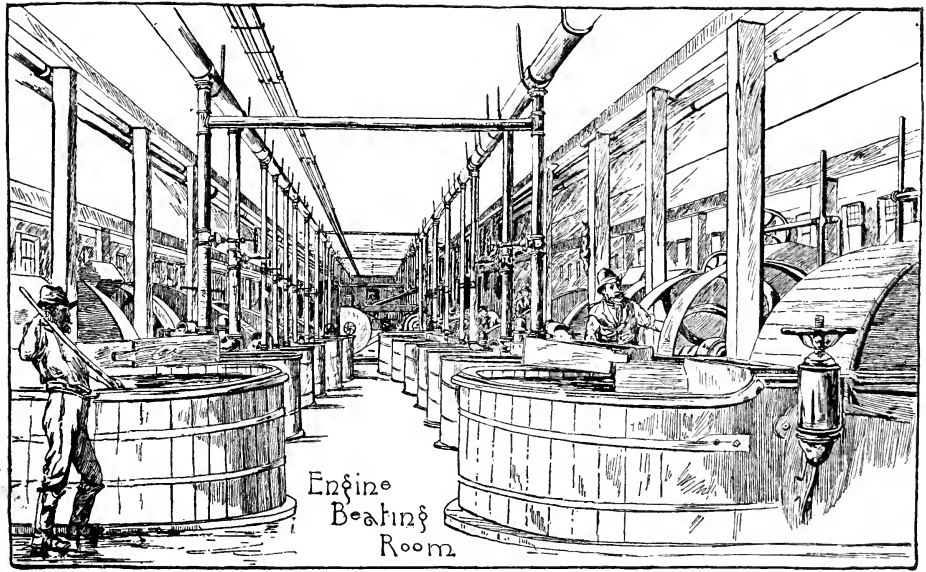
Interior of the Rope-walk.

Manila Paper and Bagging for baling Cotton. We do not think it here necessary to give a description of how these articles are made, as it would probably not interest you, but give an engraving of our "engine beating" room for preparing paper pulp, and one of our paper machine room, which will give you some idea of the processes.

Our Bagging for baling Cotton is made entirely of Jute, which is an East India product. We are also the largest manufacturers of this article in the world, making enough to cover one quarter of the entire Cotton Crop of the United States,

We mark our first quality goods in the following way.

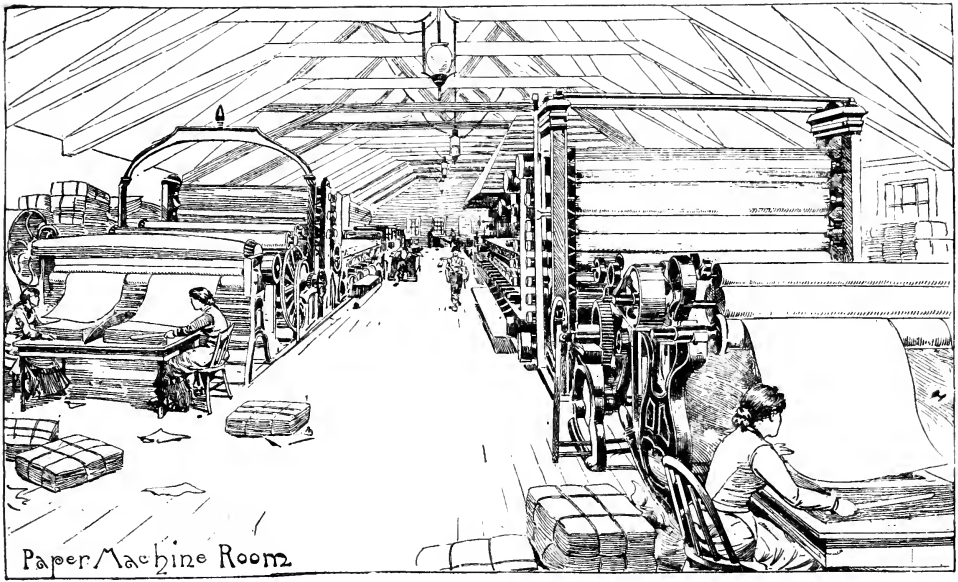
Our small Rope will have a red yarn run through the centre of it, and our large Rope through the centre of one of the strands. Our Bagging has a number of different brands. Our Harvester Twine is to be known as standard "RED TIN TAG TWINE;" this is our trade mark and copyrighted, and we intend to rigorously prosecute any one infringing it. We enclose one of the tin tags with which our Twine will be labelled, that you may become familiar with it and thus avoid counterfeits.


Engine
Beating
Room

The Rope made by us is used for innumerable purposes; but Harvester Twine is for the most part used for binding Wheat, Oats, and other small grains.

The Wheat harvest begins in Texas about the 1st of May, and ends in Dakota about the 1st of September. Four-fifths of all the Wheat in the United States is cut by machine, and when these machines all become self-binding, you can begin to estimate the immense amount of Twine that will be necessary to supply them annually. In the season just past, there were consumed about 17,000 tons of Mixed Manila and Sisal Harvester Twine.

We claim for our Twine that it is *more uniform*, *smoother*, *freer from bunches*, and *stronger* on the average, than that made by any other maker; our balls of Twine are also packed very solidly, and will, therefore, carry much better, and pull out from the hopper easily, and not tangle. Moreover, the hopper, on account of the compactness of the balls, will carry more Twine than if the balls were wound loosely. We claim all these good qualities for our standard "Red Tin Tag Twine," and trust that you will prove them by trying them in the field next season.

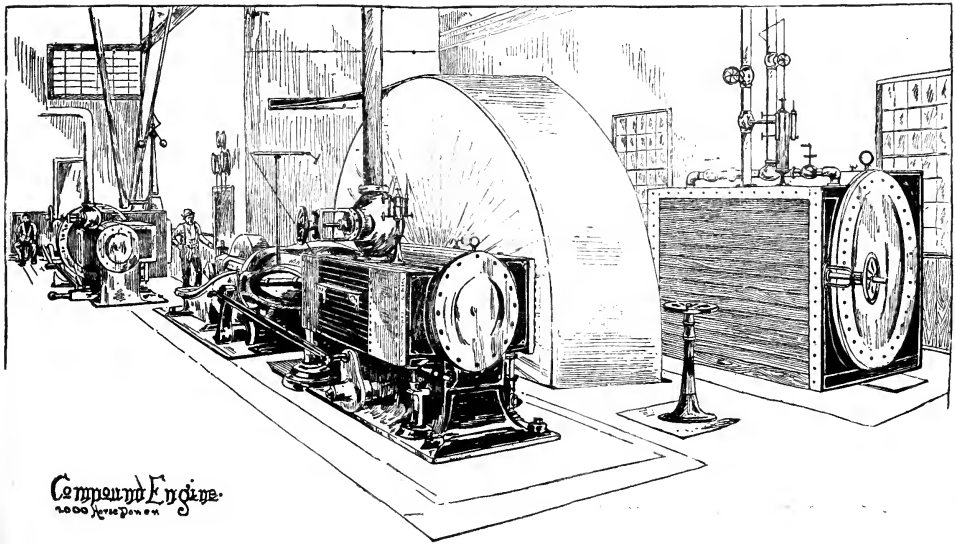

Paper Machine Room

Do not be influenced by the interested arguments of the manufacturers of harvester machines and their agents, who are anxious to keep the Twine business in their own hands, and stand between the maker of the Twine and the dealer, thus obliging the farmer to pay an extra profit. After the information we have given you in this pamphlet, we trust that all farmers will be able to use their own judgment about the quality of the Twine that is offered them.

Our long experience and our unvaried success during the last half century, will be guarantee enough that our representations are correct.

You can see by the engraving of our factory on the last page, that it covers an immense amount of ground, and when you consider that the Rope Walk itself (which is the building in the back-ground) is about 1700 feet in length, you can judge how enormous in the aggregate the other buildings are. Our grounds consist of about fifteen acres, mostly covered by buildings, and our annual product amounts to **46,000,000** pounds, and is continually increasing.

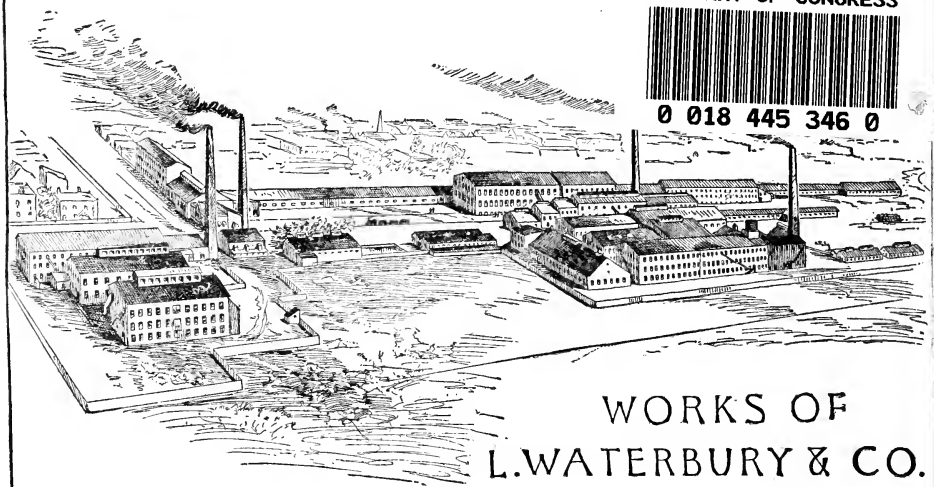
The last engraving is one of our big compound engine of 1000 horse



Compound Engine.
2000 Horse Power.

power, which runs our Harvester Twine and Paper Mills. It is probably the largest stationary factory engine in the country. The large cylinder is 4 feet long by 4 feet 8 inches in diameter, and the small one is 4 feet long, by 2 feet 6 inches in diameter. The fly wheel is 20 feet in diameter, and 6 feet face, and runs 55 revolutions per minute. It is supplied with steam by eight enormous tubular boilers of 150 horse power each, which consume fifteen tons of coal a day. We have another very large engine of some 750 horse power, and of which we have not given an engraving, but which was the largest factory engine in use, until the one was made which we have just described. It was, moreover, specially noted for having the largest leather belt that has ever been put on an engine, and which was exhibited at the Paris Exposition. We have also several other engines of smaller capacity; our total power aggregating some 3500 horse.

The buildings are lighted by electricity, furnished by two dynamo machines, aggregating 40,000 candle power; and over 2000 hands are employed in all departments.



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